Республик

Государственный комитет СССР по делам изобретений и открытий

ИЗОБРЕТЕНИЯ
К АВТОРСКОМУ СВИДЕТЕЛЬСТВУ

(11) 660689

(61) Дополнительное к авт. свид-ву —

(22) Заявлено 25.11.77 (21) 2546613/28-13

с присоединением заявки № —

(23) Приоритет —

Опубликовано 05.05.79. Бюллетень № 17

Дата опубликования описания 08.05.79

(51) М. Кл.²
A 61 M 29/00

(53) УДК615.477.
.85(088.8)

(72) Автор изобретения А. Я. Кононов

(71) Заявитель Харьковский научно-исследовательский институт общей и неотложной хирургии

(54) УСТРОЙСТВО А. Я. КОНОНОВА ДЛЯ УСТАНОВКИ ПРОТЕЗА В ТРУБЧАТОМ ОРГАНЕ

1

Изобретение относится к медицинской технике, а именно к устройствам для лечения аневризм аорты.

Устройство для установки протеза в трубчатом органе является новым, в патентной и научно-технической литературе не описано.

Целью изобретения является создание устройства для установки протеза в трубчатом органе, обеспечивающего возможность дистанционного внутриаортального введения без вскрытия сосуда.

Эта цель достигается тем, что устройство содержит съемный трубчатый кожух с рукояткой, средство для установки протеза со скобками с шипами для закрепления его на трубчатом органе, неподвижное основание, подпружиненную каретку, установленную на основании, и гибкие тяги для фиксации.

Кроме того, средство для установки протеза выполнено в виде эластичной трубки с надувными баллонами.

Сущность изобретения поясняется чертежом, на котором схематично изображено устройство для установки протеза в трубчатом органе, общий вид.

2

Устройство для установки протеза в трубчатом органе содержит съемный трубчатый кожух 1 с рукояткой 2, протез 3 со скобками 4 с шипами для закрепления его на трубчатом органе, средство для установки протеза, выполненное в виде эластичной трубки 5 с надувными баллонами 6, соединенных между собой и насосом 7 резиновой трубкой 8, неподвижное основание 9, подпружиненную каретку 10, установленную на основании, и гибкие тяги 11 для фиксации.

Устройство работает следующим образом.

Протез 3 устанавливают предварительно концами напротив каждого из соединенных эластичных баллонов 6, пропустив внутрь просвета эластичной трубки 5 гибкие тяги 11 от основания скобок 4 к подвижной подпружиненной каретке 10. Затем протез 3 сворачивается по спирали вокруг эластичной трубки 5 и вводится в трубчатый кожух 1. При этом гибкие тяги 11 с помощью каретки натягивают, растягивая по оси и фиксируя тем самым протез 3 на эластичной трубке 5. Каретка гибких тяг 11 фиксируется в таком положении шпилькой 12 на неподвижном основании 9.

У больного с установленным диагнозом (аневризма восходящей, нисходящей, брюшной аорты ниже отхождения почечных артерий) из забрюшинного доступа слева выделяют бифуркацию аорты, которую берут на турникеты и производят поперечную аортотомию. В образовавшийся просвет вводят устройство под рентгено-телевизионным контролем. При достижении проксимального конца аневризматического мешка в зоне сегмента аорты, не подверженного патологическому процессу, установленному с помощью дополнительных методов исследования, выводят эластичный трубчатый кожух 1 в нижнее положение. Протез 3 с пришитыми скобками 4 по концам удерживается гибкими тягами 11 на каретке тяг шпилькой 12. После снятия шпильки 12 сосудистый протез 3 остается зафиксированным неподвижно на эластичной трубке 5 уже с помощью подпружиненной каретки 10 гибких тяг 11.

Насосом 7 через резиновую трубку 8 подают физиологический раствор в эластичные баллоны 6, которые при помощи подпружиненной каретки 10 гибких тяг 11 в радиальном направлении расправляют сосудистый протез 3 до полного соприкосновения протеза с внутренней стенкой аорты, где с силой, создаваемой раздуваемыми физиологическим раствором баллонов 6, шипы скобок 4 обоих концов протеза 3 вонзаются в стенку аорты. При этом подпружиненная каретка 10 под действием гибких тяг 11 перемещается по неподвижному основанию. При отсасывании физиологического раствора эластичные баллоны 6 занимают исходное положение. Так как гибкие тяги 11 двойные, закрепленные на подпружиненной каретке 10, то для извлечения из-под скобы 4 протеза 3 их перерезают по одной нити, после чего устройство извлекают из полости аорты, а рану аорты зашивают обычным способом.

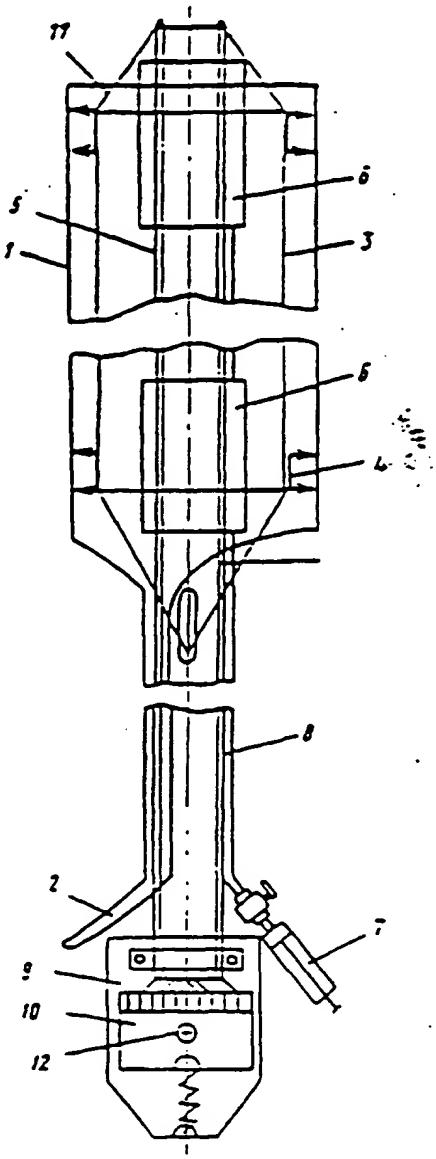
Операцию производят в условиях управляемой гипотонии с применением антикоагулянтов. В послеоперационном периоде также необходима гипотензивная и антикоагулянтная терапия.

Предлагаемое устройство обеспечивает возможность дистанционного внутриаортального введения и фиксации протеза в аневризматически расширенном участке аорты без вскрытия сосуда.

Формула изобретения

1. Устройство для установки протеза в трубчатом органе, преимущественно в сосуде, *отличающееся* тем, что, с целью обеспечения возможности дистанционного внутриаортального введения протеза без вскрытия сосуда, оно содержит съемный трубчатый кожух с рукояткой, средство для установки протеза со скобками с шипами для закрепления его на трубчатом органе, неподвижное основание, подпружиненную каретку, установленную на основании, и гибкие тяги для фиксации.

2. Устройство по п.1, *отличающееся* тем, что средство для установки протеза выполнено в виде эластичной трубки с надувными баллонами.



Составитель С. Малютина
Редактор Ж. Рожкова
Техред О. Луговая
Корректор С. Шекмар
Заказ 2328/5
Тираж 671
Подписное
ЦНИИПИ Государственного комитета СССР
по делам изобретений и открытий
113035, Москва, Ж—35, Раушская наб., д. 4/5
Филиал ППП «Патент», г. Ужгород, ул. Проектная, 4

Union of the Soviet Socialist Republics

Johnson & Johnson
Translation

USSR State Inventions and Discoveries Committee

DESCRIPTION OF INVENTION
Supplement to Authorship Certificate

(61) In addition to authorship certificate -

(22) Claim submitted on 11/25/77

(21) 2546613/28-13 with attachment of claim # -

(23) Degree of priority -

Published on 5/5/79. Bulletin # 17

Date when the description was published: 5/8/79

(11) 660689

(51) M. Kl.[2] A 61 M 29/00

(53) UDK615.477.85(088.8)

---

(72) Author of invention: A. Y. Kononov

(71) Claim is being submitted by: Kharkov Research Institute of General and Urgent Surgery

---

(54) A. Y. KONONOV'S DEVICE FOR PLACEMENT OF A PROSTHESIS INTO A TUBULAR ORGAN

1

The invention falls into a class of medical equipment, namely, devices for the treatment of aortic aneurisms.

The device for placement of a prosthesis into a tubular organ is novel and has not been described previously in patenting and/or scientific literature.

The aim of the invention was to design a device for placement of a prosthesis into a tubular organ allowing a distant-access intraortal introduction without dissecting a vessel.

This aim is achieved by the device which consists of a removable tubular casing with a handle, means for placement of a prosthesis with sharp-ended staples securing it on a tubular organ, an immobile foundation, a spring-supported carriage placed on a foundation, and flexible grips for fixation.

In addition, the means for placement of a prosthesis consist of an elastic tube with inflatable balloons.

The essence of the invention is explained in a sketch containing a schematic general overview of the device for placement of a prosthesis into a tubular organ.

2

The device for placement of a prosthesis into a tubular organ consists of a removable tubular casing [1] with a handle [2], a prosthesis [3] with sharp-ended staples [4] for securing it on a tubular organ, and means for placement of a prosthesis which consist of an elastic tube [5] with connected inflatable balloons [6], a pump [7], a rubber tube [8], an immobile foundation [9], a spring-supported carriage placed on a foundation [10], and flexible grips for fixation [11].

The device works as follows.

Initially, a prosthesis [3] is installed with its ends opposite each of the connected elastic balloons [6], which is achieved by passing flexible grips [11] connecting foundations of staples [4] and the mobile spring-supported carriage [10] through the lumen of the elastic tube [5]. The prosthesis [3] is then wrapped in a spiral around the elastic tube [5] and inserted into the tubular casing [1]. Thus, with the help of the carriage, flexible grips [11] stretch the prosthesis [3] along its axis and position it on the surface of the elastic tube [5]. The carriage connected to flexible grips [10] is secured in its position by a small pin [12] on the immobile foundation [9].

The aorta of a patient with a confirmed diagnosis (aneurism of the ascending, descending or abdominal aorta below renal arteries) is accessed extraperitoneally from left and the bifurcation of the aorta is exposed and clamped using tourniquets; then, aortotomy is performed. Under a continuous X-ray/TV monitoring, the device is introduced into the lumen of the aorta. When the device reaches the proximal end of an aneurismal sac in the healthy section of the aorta (whose border must be established using additional diagnostics), the elastic tubular casing [1] is placed in its lower position. The prosthesis [3] with staples [4] sewed to its ends is secured in its position by flexible grips [11] connected to the carriage immobilized by the small pin [12]. After the small pin [12] is removed, the prosthesis [3] remains immobilized on the elastic tube [5] by the spring-supported carriage [10] of flexible grips [11].

Then, the pump [7] fills the elastic balloons [6] with saline solution via the rubber tube [8], which forces the balloons to radially straighten the vessel prosthesis [3] with the help of the spring-supported carriage [10] of flexible grips [11] until the prosthesis makes full contact with the inner surface of the aortic wall, at which point the increasing swelling of the balloons [6] makes the sharp-ended staples [4] on both ends of the prosthesis [3] thrust into the aortic wall. At this time, the spring-supported carriage [10] is driven by flexible grips [11] along the immobile foundation. The saline solution is then suctioned off, and the elastic balloons [6] return to their

4

original position. Since the structure of flexible grips [11] connected to the spring-supported carriage [10] is that of a doubled thread, removal of grips under the staple [4] of the prosthesis [3] is achieved by cutting one of the threads, after which the device is withdrawn from the aorta and the anastomosis is performed using conventional techniques.

Operation must be carried out under conditions of manageable hypotension using anticoagulants. During the postoperative period hypotensive and anticoagulant therapies are also indicated.

The device being offered allows a distant-access intraortal introduction and fixation of a prosthesis into a part of the aorta distended by aneurism without dissecting a vessel.

Claims

1. A device for placement of a prosthesis into a tubular organ, mainly a vessel, *characterized* in that, in order to allow a distant-access intraortal introduction of a prosthesis without dissecting a vessel, it consists of a removable tubular casing with a handle, means for placement of a prosthesis with sharp-ended staples for securing it on a tubular organ, an immobile foundation, a spring-supported carriage placed on a foundation, and flexible grips for fixation.

2. The device of Claim 1, *characterized* in that the means for placement of a prosthesis are realized by an elastic tube with inflatable balloons.

[page 3]

Document prepared by: S. Malytina

Editor: Z. Rozhkova

Technical editor: O. Lugovaya

Proofreader: S. Shekmar

Order #2328/5

Number of copies: 671

By subscription only

Central Research Institute of Inventions, USSR State Inventions and Discoveries Committee

113035, Moscow, Zh-35, Raushkaya Quay, #4/5.

Branch of PPP "Patent", City of Uzhgorod, Proektnaya St., #4.

Cook

Translation

Union of Soviet Socialist Republics

State Committee of USSR for Matters of Inventions and Discoveries

DESCRIPTION of the INVENTION for the Author's Certificate

(11) 660689

D

(51) Supplementation for Author's Certificate

(22) Application Date: 11/25/77 (21) 2546611/28-13
Superseding Application No. _____

(23) Priority
Published 5/5/79 Bulletin No. 17
Date of Publication of Description 5/8/79

(51) International Class 2
A61M29/00

(53) YDK 615.177.
.85 (088.8)

(72) Author of Invention (Inventor) A. Ya Kononov

(71) Applicant: Kharkov Scientific - Research Institute Of General and Emergency Surgery

(54) "A. Ya Kononov's Device for Implanting a Prosthesis in a Tubular Organ"

1

The invention relates to medical technology, namely to devices for the treatment of an aortic aneurysm.

The device for implanting a prosthesis into a tubular organ is novel and has not been previously described in patent or scientific technical literature.

The goal of the invention is to make a device for implanting a prosthesis into a tubular organ, which makes possible the remote intra-aortic delivery of the prosthesis without exposing the vessel.

This goal is achieved because the device comprises: a removable tubular sheath which has a handle, means for implanting the prosthesis, the prosthesis having anchoring pins for securing the prosthesis in the tubular organ, a stationary base, a spring-loaded carriage, this carriage being mounted on the base, and flexible cords for retaining the prosthesis.

In addition, the means for implanting the proschesis is made in the form of an elastic tube with inflatable balloons.

The essence of the invention is illustrated by the drawing which schematically shows the device for implanting a prosthesis in a tubular organ in a general view.

2

The device for implantation of the prosthesis into a tubular organ comprises: a removable tubular sheath 1 with handle 2, prosthesis 3 with anchors 4 with pins for securing the prosthesis in the tubular organ, means for implanting the prosthesis made in the form of an elastic tube 5

with inflatable balloons 6, which are connected together and with pump 7 by rubber tube 8, stationary base 9, spring-loaded carriage 10, which is mounted on the base, and flexible cords 11 for retaining the prosthesis.

The device is operated in the following way.

The prosthesis 3 is first placed on the inflatable balloons 6 with each end opposite a balloon, and the flexible cords 11 at the base of the anchors 4 are passed through the lumen of the elastic tube 5 to the spring-loaded carriage 10. Then prosthesis 3 is coiled into a spiral around elastic tube 5 and inserted into tubular sheath 1. At the same time, the flexible cords 11 are tensioned by the carriage, thereby stretching along the axis and retaining the prosthesis 3 onto the elastic tube 5. The carriage with the flexible cords 11 is fixed in this position with the center pin 12 on the stationary base 9.

Given a patient with an established diagnosis (aneurysm of ascending, descending, and infrarenal portion of abdominal aorta), a left retroperitoneal approach is used to expose, and tourniquets are applied to isolate, the aortic bifurcation and a transverse aortotomy is performed. The device is inserted into the lumen and delivered under x-ray and television control. When the device reaches the proximal end of the aneurysmal sac in a segment of the aorta which is not diseased, which has been established from previous tests, the elastic tubular sheath 1 is moved downward. The prosthesis 3 with the anchors 4 is held at the ends by flexible cords 11 on the

carriage by cotter pin 12. After removal of cotter pin 12 the vascular prosthesis 3 is retained motionless on elastic tube 5, because of the spring-loaded carriage 10 and flexible cords 11.

Pump 7 feeds physiological solution through rubber tube 8 into elastic balloons 6 which, with the aid of spring-loaded carriage 10 and flexible cords 11, in a radial direction, expand prosthesis 3 into full contact with the inner surface of the aorta, where by force, which is created by the inflation of the balloons 6 with physiological solution, the anchors 4 on both ends of the prosthesis 3 enter the aortic wall. At the same time spring-loaded carriage 10 urged by flexible cords 11 moves along the stationary base. Then with suction of the physiologic solution from elastic balloons 6 they return to their original position. Because the flexible cords 11 are doubled and tied to the spring-loaded carriage 10, in order to remove the cords from the anchors 4 on prosthesis 3 one end of each cord 11 is cut, and thereafter the device is removed from the aortic lumen, and the cut down in the aorta is closed by conventional means.

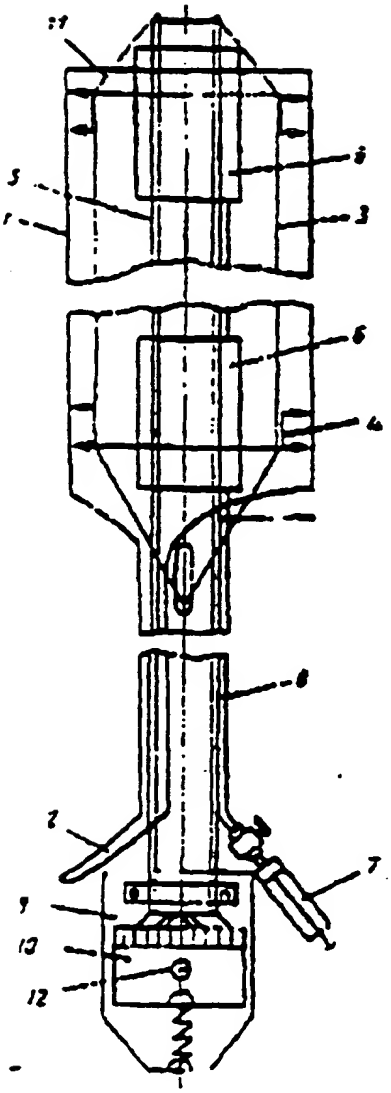
The procedure is carried out under conditions of controlled hypotension and anticoagulant therapy. Hypotensive and anticoagulant therapy is also necessary in the post-procedure period.

The proposed devices makes it possible to perform remote intra aortal delivery and implantation of a prosthesis in the aneurysmatically enlarged segment of the aorta without exposing the vessel.

CLAIMS OF THE INVENTION

1. A device for implanting a prosthesis in a tubular organ, primarily in a vessel, which is distinguished because of, its goal for making possible the remote intra-aortic delivery of the prosthesis without opening of the vessel. It comprises a removable tubular sheath with a handle, a means for implantation of the prosthesis having anchors with pins for securing it in a tubular organ, a stationary base, a spring-loaded carriage which is placed on the base and flexible cords for retention of the prosthesis.

2. The device of No. 1 distinguished because of, the means for the implantation of the prosthesis is made in the form of an elastic tube with inflatable balloons.



Составитель С. Малютина
Редактор Ж. Романова
Техред О. Луговая
Корректор С. Шекмар
Заказ 2328/3
Тираж 671
Подписное
ЦНИИПИ Государственного комитета СССР
по делам изобретений и открытий
113035, Москва, Ж—35, Раушская наб., д. 4/5
Филиал ППП «Патент», г. Ужгород, ул. Проектная, 4